Remarks

This is in response to the Office Action dated April 13, 2004.

In the latest Office Action, the examiner has added Genter (US 5,157,653) to the previously applied reference Katayanagi et al. (US 5,732,390) for rejecting claims 1-4, 8-11, 15-19 and 23-24 as being obvious under 35 U.S.C. 103(a). The examiner moreover has added Genter to the combination of Katayanagi and the previously applied Gerson article for rejecting claims 5-7, 12-14 and 20-22 as being obvious under 35 U.S.C. 103(a). The examiner in essence argues that Genter discloses the "variation detection means", which the examiner admits to be missing from the teachings of Katayanagi.

It is respectfully submitted that the examiner has erred in his constructions of the teachings of Genter, as it is believed that Genter could not be combined with Katayanagi as asserted by the examiner, or in fact teaches a "variation detection means", per discussion hereinbelow.

Before discussing Genter, it should be noted that the telephone that is to be used with the Katayanagi system is a portable telephone that is not connected to any land line (column 1, lines 36-38). On the other hand, Genter discloses an echo canceller that is to be used with a land line telephone (Fig. 1) in which the echo canceller 20 is superimposed along the transmission path for subtracting the anticipated echo signal that may be received from a far end speaker. Such echos are well known to propagate along transmission lines. In particular, the Genter invention attempts to eliminate the problems of echos by replacing a conventional echo canceller, which uses a conventional center clipper that clips the signal at a predetermined threshold amplitude that causes the crackles (column 2, lines 52-60), with a non-linear processor that includes multipliers for attenuating the error signal over a continuous range rather than clipping the error signal when the error signal exceeds the

predetermined threshold. To this end, the non-linear processor also includes noise injection means that senses the average noise level on the transmission line and inserts as needed a broadband noise signal in the output at a variable amplitude to maintain a constant noise level at the output, as the input signal that includes noise is being attenuated (column 3, lines 1-12; lines 53-65).

The examiner asserts that Fig. 4 of Genter teaches "a noise level estimation process that includes a variation estimation process". The examiner further argues that Fig. 4 shows an EAVG signal that corresponds to the presently sampled level of the claimed invention, and a FAVG signal that corresponds to the previously sampled level of the claimed invention. The examiner further relied on the showing in Fig. 4 of a $NATT_{m+1}$ signal and an element $NATT_n$ component for arguing that Genter teaches an estimation means that could be combined with the teachings of Katayanagi for rejecting the instant invention.

A more detailed review of the complete teachings of Genter, as well as a detailed review of Fig. 4 coupled with the teachings of Figs. 1 and 2, show that the interpretation by the examiner is without basis.

More specifically, as mentioned previously, Fig. 1 shows the placement of the echo canceller 20 between the communications network 24 and the CODEC 28, which converts the digital signal into an analog signal for telephone 22. Moreover, Fig. 1 clearly shows that echo canceller 20 is connected to the land line whereby a received input RI is sent by communications network 24 to CODEC 26, and a sent input signal SI from CODEC 26 is sent to communications network 24 as a signal SO. To eliminate the echos that are reproductions of the signals superimposed on the transmitted signals, the Genter echo canceller 20 includes a non-linear processor 82 which, as shown in Fig. 2, includes a floor noise factor determination means 42. And it is this floor noise factor determination means 42, and more in particular its processes, that are

shown in Fig. 4. The floor noise factor determination means 42 is not an estimation means, per assertion by the examiner.

As shown in Fig. 4, with an eye also on Fig. 2 and the disclosure from column 7, line 5 to column 8, line 3, it can be seen that the signals input to Fig. 4 are the SAVG (average signal of the input signal SI), the EAVG (average signal of the error line) and the FAVG (average level of the attenuated noise signal NXA). As further shown in Fig. 4, the FAVG signal is compared with the EAVG signal to determine a floor noise level. And if the level of EAVG falls below FAVG, then the attenuation factor signal is reduced, so that the amplitude of the attenuated noise signal NXA is correspondingly decreased. Note that signal NXA results from the noise source NX being multiplied with the variable attenuation factor NATT (see Fig. 1). On the other hand, if EAVG is larger than FAVG, the value of NATT and accordingly the value of NXA are increased by a preset amount. The value of NXA is therefore controlled so that it will match the noise floor of the residual echo signal ERR (column 7, lines 40-51).

Thus, an analysis of the processes performed by the floor noise factor determination means 42, as shown in Fig. 4, clearly shows that the floor noise factor determination means is not an estimation means as set forth in the claims which is in responsive to a clock signal for estimating, renewing and outputting an estimated environment noise level.

Clearly, there is no environment noise level for the Genter system or could there be any, insofar as the Genter land line system is not affected by environmental noises. And more to the point, Genter discloses an echo canceller that cancels echoes that are superimposed over transmission signals. Such system is clearly different from the Katayanagi system. A thorough discussion of the echo canceller of Genter is given in column 10, line 29 to column 11, line 59. Genter therefore does not disclose, or suggest, any estimation means, let alone any "presently sampled level", "previously sampled level", as asserted by the examiner, for the EAVG and FAVG signals disclosed

in Genter are not presently sampled level and previously sampled level, respectively, per assertion by the examiner.

To emphasize the distinction between the EVAG (average signal of the error line) and the FAVG (average level of the attenuated noise signal NXA) in Genter, and the "presently sampled level" and the "previous sampled level" of the present invention, the pending independent claims have been amended.

Regarding the first distinction, as noted above, it may be true that Genter determines whether the level of the EVAG falls below the FAVG (see Fig. 4 and Col 7, lines 40-51 of Genter).

But as further discussed above and disclosed by Genter, the EVAG and the FAVG, however, are clearly different signals, because the EVAG represents the "average signal of the error line" and the FAVG represents the "average level of the attenuated noise signal NXA)".

In contrast, in the present invention, the "previously sampled level is sampled one sample before the presently sampled level". In other words, the previously sampled level and presently sampled level are sequentially sampled by the sampling means.

These presently and previously sampled levels, therefore, are clearly distinguishable over the EVAG and the FAVG.

As reasonably derived by the distinction, the variation detection means of the present invention has a function of detecting whether the presently sampled level increases from the previously sampled level, whose function is clearly distinct from the function shown in Fig. 4 of Genter, which compares the EVAG and the FAVG.

In addition, the factor determination means 42 of Genter performs the NATT changing operation on condition that the EVAG becomes larger than the FAVG (see Fig. 4 and Col 7, lines 40-51 of Genter).

In contrast, the estimation means of the present invention performs the estimating, renewing, and outputting functions under the condition when the variation detection means detects that the presently sampled level increases from the previously sampled level.

As set forth above, these presently and previously sampled levels are clearly distinguishable over the EVAG and the FAVG, the condition of the estimation means is clearly distinguishable over that of the factor determination means 42 of Genter.

The same arguments with respect to Katayanagi and Gerson previously presented are equally applicable herein.

In light of the foregoing, the examiner is respectfully requested to reconsider the application and pass the same to issue.

Respectfully submitted,

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